Ultrathin tabular grain emulsions with novel dopant management

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Abstract

A chemically and spectrally sensitized ultra-thin tabular grain emulsion is disclosed including tabular grains (a) having ä111ü major faces, (b) containing greater than 70 mole percent bromide, based on silver, (c) accounting for greater than 90 percent of total grain projected area, (d) exhibiting an average equivalent circular diameter of at least 0.7 mu m, and (e) exhibiting an average thickness of less than 0.07 mu m. It has been observed that increased speed and contrast as well as improvements in speed-granularity relationships can be realized when the surface chemical sensitization sites include epitaxially deposited silver halide protrusions forming epitaxial junctions with the tabular grains, the protrusions (a) being located on up to 50 percent of the surface area of the tabular grains, (b) having a higher overall solubility than at least that portion of the tabular grains forming epitaxial junctions with the protrusions, and (c) forming a face centered cubic crystal lattice. In further improving photographic performance by incorporating a photographically useful dopants, it has been observed that iridium placed in the ultrathin tabular grains and a shallow electron trapping site providing dopant placed, in the silver halide protrusions can together increase photographic speed and reduce high intensity reciprocity failure.